

Patent Claims

1. A transceiver for a transmission and reception
signal which can be transmitted via a signal line
5 having a particular line impedance (Z_{LINE}), having:

a) a line driver (6) for driving a transmission
signal via the signal line and having

10 b) an analog echo cancellation filter (15) for signal
suppression for an echo signal brought about by the
transmission signal,
characterized
in that the line driver (6) has a synthesized output
15 impedance (R_{SYN}), with the line driver (6) having a
downstream hybrid circuit (11) for connecting an analog
echo cancellation filter (15).

2. The transceiver as claimed in claim 1,
20 characterized
in that the analog echo cancellation filter (15) is
programmable.

3. The transceiver as claimed in claim 2,
25 characterized
in that the transfer function of the echo cancellation
filter (15) has a programmable pole point and a
programmable zero point.

30 4. The transceiver as claimed in claim 1,
characterized
in that the line driver (6) is of differential design.

5. The transceiver as claimed in claim 1,
35 characterized
in that the synthesized output impedance (R_{SYN}) of the
line driver (6) is real.

6. The transceiver as claimed in claim 1,
characterized
in that the hybrid circuit (11) has a first two-pole
connection (10a, 10b) next to the output of the line
5 driver (6),
a second two-pole connection (12a, 12b) for connection
to the signal line, and
a third two-pole connection (14a, 14b) for connection
to the analog echo cancellation filter (15).
- 10 7. The transceiver as claimed in claim 6,
characterized
in that the first connection (10a, 10b) on the hybrid
circuit (11) and the second connection (12a, 12b) on
15 the hybrid circuit (11) have series resistors (R1, R1')
between them which are connected in series with the
line impedance (Z_{LINE}) of the signal line.
- 20 8. The transceiver as claimed in claim 6,
characterized
in that the first connection (10a, 10b) on the hybrid
circuit (11) and the second connection (12a, 12b) on
the hybrid circuit respectively have a first and a
second series-connected crosscoupling resistor (R2,
25 R2', R3, R3') between them.
9. The transceiver as claimed in claim 6,
characterized
in that the third two-pole connection (14a, 14b) on the
30 hybrid circuit (11) for connecting the echo
cancellation filter (15) is tapped off between the
series-connected crosscoupling resistors (R2, R3', R2',
R3).
- 35 10. The transceiver as claimed in claim 6,
characterized

in that the resistance values of the resistors connected in the hybrid circuit (11) satisfy the following equation:

$$R2 = R3 \cdot \frac{R_{SYN}}{R1 + R_{SYN}}$$

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where R1 is the resistance value of a series resistor, R2 is the resistance value of the first crosscoupling resistor, and

10 R3 is the resistance value of the second crosscoupling resistor, and

where R_{SYN} is the synthesized output impedance of the line driver (6).

11. The transceiver as claimed in claim 6,
15 characterized
in that the resistors (R1, R1', R2, R2', R3, R3') connected in the hybrid circuit (11) are real resistors.

20 12. The transceiver as claimed in claim 6,
characterized
in that the hybrid circuit (11) is of symmetrical design.

25 13. The transceiver as claimed in claim 1,
characterized
in that a reception filter (22) is provided for filtering a signal received via the signal line.

30 14. The transceiver as claimed in claim 1,
characterized
in that a subtraction circuit (19) is provided which subtracts from the filtered output signal from the reception filter (22) the transmission signal simulated
35 by the echo cancellation filter (15) in order to generate a reception signal which has been liberated of the echo signal.

15. The use of the transceiver as claimed in claim 1 for a broadband communication system, particularly for an xDSL broadband communication system.